

## Original Article

# The effect of comprehensive nursing on gynecologic and obstetric laparoscopy and its influence on patients' pain levels

Yanli Zou<sup>1\*</sup>, Liping Song<sup>1\*</sup>, Shuai Zhang<sup>1\*</sup>, Junhong Guo<sup>2</sup>, Xuejing Gu<sup>1</sup>, Wenjing Wang<sup>1</sup>

<sup>1</sup>Department of Nursing, Liaocheng Dongchangfu District Maternity and Child Health Care Hospital, Liaocheng, Shandong Province, China; <sup>2</sup>Department of Nursing, Liaocheng Dongchangfu People's Hospital, Liaocheng, Shandong Province, China. \*Equal contributors and co-first authors.

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**Abstract:** Objective: To investigate the effect of comprehensive nursing on gynecologic and obstetric laparoscopy and its influence on patients' pain levels. Methods: A prospective approach was used. A total of 90 patients who underwent laparoscopic surgery in our hospital were randomly divided into the control and study groups. The control group was given routine nursing in obstetrics and gynecology, and the study group was given comprehensive nursing. The postoperative recovery, psychological status, stress response, pain levels, quality of life, and complications of the two groups were compared. Results: Compared with the control group, the first exhaust times, the bowel sound recovery times, and the first getting out of bed times in the study group were considerably earlier, and the hospital lengths of stay were significantly shorter (all  $P < 0.05$ ). Before the intervention, there were no significant differences in the Hamilton Anxiety Scale (HAMA), the Hamilton Depression Rating Scale (HAMD), or the generic quality of life inventory-74 (GQOLI-74) scores between the two groups (all  $P > 0.05$ ). After the intervention, the patients' HAMA and HAMD scores in the two groups were decreased, and the GQOLI-74 scores were increased at three months after the intervention. The changes in the study group were more pronounced (all  $P < 0.05$ ). The cortisol levels in the plasma and the serum epinephrine levels in the two groups were significantly higher than they were in the control group at three days after the operations. Still, the levels in the study group were lower than the levels in the control group ( $P < 0.05$ ). The two groups' visual analogue scale (VAS) scores decreased gradually from 1 to 7 days after the operation, and the study groups' VAS scores were lower than the control groups' VAS scores at 3 and 7 days after the operations ( $P < 0.05$ ). During their hospitalization, the study group's total complication rate was lower than the control groups' total complication rate ( $P < 0.05$ ). Conclusion: Comprehensive nursing for laparoscopy patients can significantly promote gastrointestinal function recovery, reduce postoperative pain, relieve anxiety and depression, and has fewer complications.

**Keywords:** Comprehensive nursing, obstetrics and gynecology, laparoscopic surgery, pain, psychology

## Introduction

With laparoscopic technology development, laparoscopy has gradually replaced traditional open surgery. It has been widely clinically with its advantages of minimal trauma, less bleeding, and quick recovery [1]. However, due to the establishment of the CO<sub>2</sub> pneumoperitoneum during laparoscopies, it takes time for the intestinal function to recover after the procedure, so abdominal distension occurs after the procedure [2]. Also, obstetrics and gynecology patients who are affected by many factors such as the disease itself and who worry about the

operation can have different degrees of psychological disorders after surgery, such as irritability, fear, and even depression and other symptoms [3]. Therefore, nursing after laparoscopic surgery is particularly important for patients in obstetrics and gynecology.

Comprehensive nursing is a process in which a group of nursing staff applies nursing procedures to complete a group of patients' nursing work. The nursing model combines the advantages of group nursing and primary nursing and is widely used in clinical nursing, especially in surgery patients' nursing [4, 5]. Although lapa-

roscopic surgery is a minimally invasive surgery, the patients still feel pain after the surgery. Wells et al. pointed out that timely and effective comprehensive nursing intervention measures after laparoscopic surgery are of positive significance in relieving postoperative pain and reducing abdominal distension complications [6].

However, previous studies on comprehensive nursing in the laparoscopic perioperative period mainly focused on postoperative complications such as abdominal distension and constipation. This study evaluated the application effect of comprehensive nursing in gynecological and obstetric laparoscopy from the perspective of the psychological state, the stress response, the quality of life, and the complications. The study aims to provide a reference for selecting the perioperative nursing mode following laparoscopy.

### Materials and methods

#### *General information*

A prospective study was conducted. A total of 90 patients who underwent laparoscopic surgery in Liaocheng Dongchangfu District Maternity and Child Health Care Hospital from December 2018 to January 2020 were divided into the study and control groups. Inclusive criteria: patients aged 25-45 years old; females; patients who had benign diseases such as hydrosalpinx, ovarian cysts, or uterine malformations and who underwent elective laparoscopic surgery in Liaocheng Dongchangfu District Maternity and Child Health Care Hospital; patients who were informed about the study and signed the informed consent. Exclusion criteria: patients with severe infectious diseases; patients with malignant tumors; patients with liver and kidney dysfunction, diabetes mellitus, hyperlipidemia or hypertension; patients with coagulation dysfunction; and patients participating in other studies. The ethics committee of Liaocheng Dongchangfu District Maternity and Child Health Care Hospital approved this study.

#### *Methods*

The control group was given routine obstetrics and gynecology nursing, such as health education, disease explanation, medication accord-

ing to the doctor's advice, and routine examinations (such as blood pressure and temperature). The study group underwent comprehensive nursing. ① preoperative education: The nurses introduced the ward related environment to the patients before their operations to eliminate their unfamiliarity with the ward and the explain the matters which need attention to the patients and their families. ② Psychological nursing: The nurses explained the necessity and effectiveness of the operation to the patients before the operation to enhance the patients' confidence to overcome the disease. The nurses also used mild language to communicate with the patients face-to-face, and gave targeted psychological counseling to the patients with apparent adverse psychology to relieve their anxiety, tension, and other emotions, and to help them cooperate with the treatment with the best attitude. ③ Diet nursing: The patients were advised not to eat within 6 hours after the operation, and then a small amount of liquid food can be consumed [7]. The patients were advised to have more meals and eat less at each meal. According to the individual recovery of intestinal function, the regular diet is gradually restored. Moreover, the patients are advised to eat more fiber-rich foods such as fruits and vegetables to promote intestinal function recovery. ④ Prevention of complications: The nurses advised the patients to avoid gas-producing food as much as possible to reduce the degree of postoperative abdominal distension [8]. For patients with abdominal distension, the nurses massaged patients' abdomens clockwise to promote gas discharge and relieve abdominal distension. After the operations, the nurses instructed the patients to position their heads to one side to avoid inhaling foreign bodies, which may cause asphyxia and pulmonary infections. The patients were instructed to press the wound when coughing to avoid amplifying the pain. After the operation, the patients were advised to carry out leg lifting, knee bending and other movement training and to get out of bed as soon as possible to prevent deep vein thrombosis. ⑤ Discharge guidance: Before the patients' discharges, the nurses advised the patients and their families of the matters needing attention after discharge. For the patients who need to take medicine, they informed them in detail or they explained the specific medication method.

**Table 1.** Comparison of the baseline data between the two groups (n,  $\bar{x} \pm sd$ )

Index	Study group (n=45)	Control group (n=45)	$\chi^2/t$	P
Age (years)	36.3±3.1	35.5±4.4	1.067	0.289
BMI (kg/m <sup>2</sup> )	23.28±2.84	23.10±2.77	0.304	0.762
Parity (n)			1.339	0.512
0	8	6		
1	25	22		
≥2	12	17		
Operation type (n)			1.848	0.408
Ovarian cystectomy	14	18		
Uterine myomectomy	17	14		
Ectopic pregnancy surgery	6	5		
Subtotal hysterectomy	4	5		
Others	4	3		
Operation time (min)	65.5±10.9	67.7±12.1	0.906	0.367

Note: BMI: body mass index.

### Outcome measures

#### Main outcome measures

(1) The first exhaust times, the bowel sound recovery times, the first getting out of bed times, and the lengths of stay were compared between the two groups.

(2) The Hamilton Anxiety Scale (HAMA) and the Hamilton Depression Rating Scale (HAMD) were used to evaluate the levels of anxiety and depression before and after the intervention [9, 10]. The levels of anxiety and depression increased with an increase in the score.

#### Secondary outcome measures

(1) About 5 mL venous blood was collected one day before each operation and three days after each operation. About 2.5 mL of venous blood was placed in an EP tube containing anticoagulant and centrifuged (3,000 r/min, 10 min) to separate the plasma. The other 2.5 mL was centrifuged using the same method after self-coagulation to separate the serum. The plasma cortisol (COR) levels were measured using radioimmunoassay. The kits were purchased from Beijing North Biotechnology Research Institute Co., Ltd., and their origin was China. The serum adrenaline levels were measured using automatic biochemical analyzers (Beckman Coulter Company, USA).

(2) The visual simulation scores (VAS) were used to evaluate the pain levels before and after the intervention [11]. The closer to 10 the score was, the more severe the pain.

(3) The quality of life was assessed using the generic quality of life inventory-74 (GQOLI-74) before and at three months after the interventions [12]. The material life state scores in the scale ranged from 16-80 points, and the other three dimensions (social function, physical function, and psychological function) ranged from 20-100 points. The higher the score, the better the quality of life.

(4) The incidences of complications were compared between the two groups, incidences such as abdominal distension, constipation, shoulder and back pain, nausea and vomiting. The incidence of complications = number of complications/total cases \* 100%.

#### Statistical analysis

SPSS 20.0 was used for data statistics. The count data were expressed as n/%, and chi-square tests were also used. The measurement data was represented by  $\bar{x} \pm sd$  and the comparisons between the two groups were conducted using independent t-tests. The comparisons in the same group before and after the intervention were performed using paired t-tests. A difference was statistically significant when  $P < 0.05$ .

### Results

#### Baseline data

There were no significant differences in the baseline data between the two groups ( $P > 0.05$ ). See **Table 1**.

**Table 2.** Comparison of the clinical indicators between the two groups ( $\bar{x} \pm sd$ )

Group	Time of first exhaust after operation (h)	Recovery time of bowel sounds (h)	Time of first ambulation (d)	Length of stay (d)
Study group (n=45)	14.49±4.06	22.03±5.69	1.74±0.34	8.46±1.29
Control group (n=45)	19.39±4.30	30.95±4.39	2.15±0.40	11.04±1.20
t	5.558	8.326	5.239	9.823
P	<0.001	<0.001	<0.001	<0.001

**Table 3.** The HAMA and HAMD scores of the two groups were compared before and after the intervention

Group	Time	HAMA score	HAMD score
Study group (n=45)	Before the intervention	8.98±1.87	7.90±1.22
	After the intervention	6.90±1.33*#	5.56±1.14*#
Control group (n=45)	Before the intervention	9.11±1.70	7.68±1.37
	After the intervention	8.23±1.32*	6.55±1.13*

Note: HAMA: Hamilton Anxiety Scale; HAMD: Hamilton Depression Rating Scale. Compared with before the intervention, \*P<0.05; compared with the control group, #P<0.05.

**Table 4.** Comparison of the COR and epinephrine levels between the two groups before and after the operations ( $\bar{x} \pm sd$ )

Group	Time	Plasma COR (µg/dL)	Serum adrenaline (ng/L)
Study group (n=45)	1 d before the operation	7.57±1.94	223.99±10.94
	3 d after the operation	8.89±1.27*#	254.49±11.74*#
Control group (n=45)	1 d before the operation	7.91±2.08	225.28±14.48
	3 d after the operation	11.03±2.77*	303.48±13.20*

Note: COR: cortisol. Compared with before the intervention, \*P<0.05; compared with control group, #P<0.05.

*The clinically relevant indicators*

Compared with the control group, the first exhaust times, the bowel sound recovery times, and the first ambulation times in the study group occurred significantly earlier. The hospital lengths of stay were considerably shorter (P<0.001), as shown in **Table 2**.

*HAMA and HAMD scores*

Before the intervention, there were no significant differences in the HAMA and HAMD scores between the two groups (P>0.05). After the intervention, the HAMA and HAMD scores in the two groups were lower than they were before the intervention, and the study groups' scores were lower than the control groups' scores (P<0.05), as shown in **Table 3**.

*The COR and epinephrine levels*

There were no significant differences in the plasma COR and serum epinephrine levels

between the two groups at one day before operation (P>0.05). On the third day after the operation, the plasma COR and serum epinephrine levels in the two groups were considerably increased. Still, the study group levels were lower than those in the control group (P<0.05), as shown in **Table 4**.

*VAS scores*

The two groups' VAS scores decreased gradually from 1 to 7 days after the operations, and the study groups' VAS scores were lower than the control groups' VAS scores on the 3rd and 7th days after the operations (P<0.05), as shown in **Table 5**.

*Quality of life*

Before the intervention, there were no significant differences in the GQOLI-74 scores between the two groups (P>0.05). Three months after the intervention, the GQOLI-74 scores in the two groups were significantly high-

**Table 5.** Comparison of the two groups' VAS scores at different times after the operation ( $\bar{x} \pm sd$ )

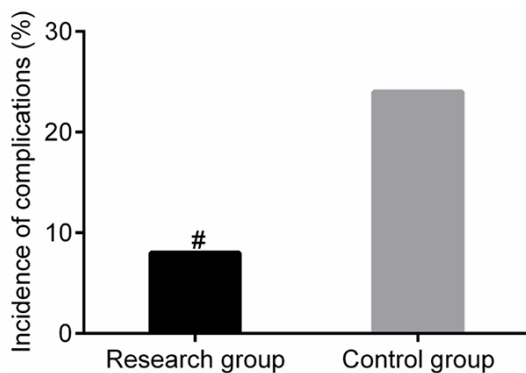
Group	1 d after the operation	3 d after the operation	7 d after the operation
Study group (n=45)	5.68±1.03	4.30±0.94	2.58±0.75
Control (n=45)	5.90±1.27	5.11±1.06	3.04±0.93
t	0.903	3.835	2.583
P	0.369	<0.001	0.011

Note: VAS: visual analog scale.

**Table 6.** Comparison of the GQOLI-74 scores between the two groups before and after the intervention ( $\bar{x} \pm sd$ )

Index	Time	Study group (n=45)	Control group (n=45)
Material life state	Before the intervention	56.59±4.85	57.04±5.48
	3 months after the intervention	67.69±5.49*.#	62.58±5.96*
Social function	Before the intervention	68.22±8.69	67.95±9.12
	3 months after the intervention	88.70±7.40*.#	74.49±8.09*
Somatic function	Before the intervention	65.59±6.50	66.03±6.06
	3 months after the intervention	77.60±7.57*.#	73.06±5.49*
Psychological function	Before the intervention	70.07±7.20	70.83±8.48
	3 months after the intervention	79.95±6.70*.#	74.48±7.90*

Note: GQOLI-74: generic quality of life inventory-74. Compared with before the intervention, \*P<0.05; compared with the control group, #P<0.05.



**Figure 1.** Comparison of the incidences of complications between the two groups during the hospitalizations. Compared with the control group, #P<0.05.

er, and the GQOLI-74 scores in the study group were higher than those in the control group (P<0.05), as shown in **Table 6**.

#### Complications

During the hospitalizations, the total complication rate of the study group was 8.89% (2 cases of abdominal distension, 1 case of constipation, and 1 case of shoulder and back pain), which was considerably lower than the 24.44% (5 points of abdominal distension, three

instances of constipation, 2 cases of shoulder pain, and 1 case of nausea and vomiting) rate in the control group (P<0.05), as shown in **Figure 1**.

#### Discussion

Although laparoscopy is a minimally-invasive surgery, patients can still have varying degrees of psychological disorders because they may have postoperative abdominal distension due to the establishment of CO<sub>2</sub> pneumoperitoneum, and patients are easily affected by the disease. So the nursing after laparoscopic surgery is critical. The comprehensive nursing measures include preoperative education, psychological counseling, diet guidance, the prevention of complications, discharge guidance, and other patient care aspects. Comprehensive nursing aims to provide patients with better and comprehensive nursing services to promote postoperative recovery. After all, laparoscopy injures patients, and the requirements of intraoperative posture and the influence of wounds are also factors leading to postoperative pain. Therefore, we should pay attention to the changes in the patients' postoperative pain levels, and if the postoperative pain intensifies, we should consider whether there are compli-

cations such as infections [13, 14]. In this study, the first exhaust times, the bowel sound recovery times, and the first ambulation times in the study group were earlier than they were in the control group. The hospital lengths of stay were significantly shortened. At the same time, the VAS scores in the study group were lower than of the VAS scores in the control group at the 3rd and 7th days after the operations, suggesting that for patients undergoing laparoscopic surgery, perioperative comprehensive nursing intervention is helpful in promoting gastrointestinal function recovery, and relieving postoperative pain, and it has a positive effect on patient prognosis. Compared with routine nursing, the comprehensive nursing intervention measures provide nursing intervention for patients from the perspective of preoperative education, psychological nursing, diet nursing, prevention of complications and discharge guidance, etc. The nursing work is more comprehensive and specific, and the intervention process runs through the whole perioperative period and even after discharge, so it helps the recovery of various patient indicators after their operations [15].

After the intervention, HAMA and HAMD scores in the study group were lower than they were in the control group, and the GQOLI-74 scores were higher than the scores in the control group, suggesting that the perioperative comprehensive nursing intervention measures can significantly improve the adverse psychological states of patients undergoing laparoscopic surgery and improve their quality of life. Stanhaier et al. found that comprehensive perioperative nursing intervention can improve patients' postoperative psychological conditions, especially for patients with anxiety or depression [16]. The effect of comprehensive nursing intervention is more pronounced, which is because in comprehensive nursing intervention, psychological counseling is emphasized for patients with abnormal psychological fluctuations. Therefore, it can alleviate patients' destructive psychology. Jennings et al. pointed out that the comprehensive intervention during the perioperative period has a significant effect on promoting patient prognosis and on improving their quality of life [17].

For the body, trauma and surgery are stressful events, promoting the hypothalamus to secrete the adrenocorticotrophic hormone. The

latter can promote COR and epinephrine secretions and induce the stress response [18, 19]. Chrouser et al. pointed out that after surgery, patients' bodies can produce the stress response, which generally reaches its peak in 2-3 days and gradually alleviates after three days until it returns to normal [20]. In this study, compared with one day before the operation and three days after the operation, the plasma COR and serum adrenaline levels of the two groups were considerably increased, but the levels in the research group were lower than those in the control group, which also showed that the body has a stress response caused by surgical stimulation. But the stress responses of the patients undergoing comprehensive nursing intervention was relatively mild. In terms of complications, abdominal distension is a common adverse reaction after laparoscopy. This is because the CO<sub>2</sub> pneumoperitoneum needs to be established during laparoscopic operations, and patients need to rest in bed after the operation. Intestinal function recovery is slow, so the incidence of postoperative abdominal distension is high [21]. The study group's total complication rate was lower than the rate in the control group (8.89% vs. 24.44%). It is suggested that perioperative comprehensive nursing intervention reduces the risk of postoperative complications of laparoscopic surgery. Many studies have similar research results. For example, Saleh et al. reported that comprehensive nursing can reduce postoperative deep vein thrombosis [22]. Trads et al. said that for laparoscopic patients, the perioperative comprehensive intervention can significantly reduce postoperative abdominal distension [23]. However, this study was a single-center study, and the sample size was small. The follow-up time was only three months. The long-term impact of comprehensive nursing on patients after laparoscopic surgery still needs to be confirmed using a larger sample and long-term studies.

In conclusion, comprehensive nursing for patients undergoing laparoscopy can significantly promote gastrointestinal function recovery, ease postoperative pain, relieve anxiety and depression, and has fewer complications, so it is worthy of clinical promotion.

### Disclosure of conflict of interest

None.

**Address correspondence to:** Wenjing Wang, Department of Nursing, Liaocheng Dongchangfu District Maternity and Child Health Care Hospital, No. 129 Zhenxing West Road, Liaocheng 252000, Shandong Province, China. Tel: +86-13375609112; E-mail: wangwenjing86dt@163.com

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